

Verneuil (A. A. S.)

# VESICO-VAGINAL FISTULA.

A TRANSLATION

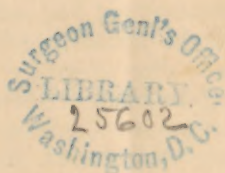
OF

ARTICLES PUBLISHED IN THE GAZETTE HEBDOMADAIRE

✓  
BY M. AR. VERNEUIL.

(A. A. S.)

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## VESICO-VAGINAL FISTULA.

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IN the course of the month of November last, a young American surgeon, Dr. Bozeman, came to Paris, and visited our hospitals. He there explained theoretically and practically the methods he employed in the treatment of vesico-vaginal fistula, which have given him a just degree of celebrity both in the United States and in Europe. Dr. Robert having at the time under his care, at the Hotel Dieu, a patient who had already been operated on twice without success, both by himself and by us, begged Dr. Bozeman to make another attempt; the method was submitted to a severe test, for the case was far from favorable—the result, however, was satisfactory.

Being present at this operation, we were able to follow its different stages. Two things struck us; first, the extreme skill of Dr. Bozeman, and then the perfection of the operation itself.

The foreign press, moreover, informing us every day of numerous successes obtained by this method, we thought it would be useful to show the progress of a surgical operation which does the greatest honor to American practice. But while collecting information upon this subject, and while consulting published works, we soon saw that Dr. Bozeman had been preceded in this branch by several of his countrymen, and during our investigations we encountered questions of priority which had been, unfortunately, discussed with a bitterness to be regretted. On seeing this, our plan changed.

Our personal inclinations, and the customs of this Journal, lead us not to recoil before the demands of impartial criticism, supported by history. To render to each one that which belongs to him, seems to us an imperative duty, and, moreover, much more useful to science than is generally thought. We resolved, then, to cast a glance upon all American surgery, so far as it touches upon vesico-vaginal fistula.

It was in 1839, by common agreement, that the first success was, if not obtained, at least made public in the United States, by Dr. Hayward, of Boston. We shall commence, therefore, with the works of this surgeon. We shall follow our inquiry up to the present time, attaching less importance to dates than to the search for new ideas; historical criticism having, above all, for its object the exposition of principles. This review is not, perhaps, entirely inopportune; we, in France, are, in fact, rather disposed to believe



that no one equals us in surgery. It would be dangerous, as well as unjust, to perpetuate this vain illusion, for one makes the greatest struggle to preserve the front rank as he sees himself on the point of being outstripped; and it concerns our dignity, as well as the interests of humanity, to recognize, at least, the progress which we have failed to realize.

Dr. Hayward (of Boston) has published two memoirs on vesico-vaginal fistulæ—one in 1839, the other in 1851. Each of these contains important ideas. I shall consider them separately.

The first publication, as I have said, bears the date of 1839. During the preceding year, the *American Journal* (1838, Vol. XXIII., p. 224) had published a translation of two articles of Dieffenbach, inserted in the *Berlin Med. Zeitung* of June and July, 1836. Dr. Hayward had read these articles, for he quotes their author, and introduces into the methods of the Berlin surgeon some happy modifications. After some generalities, he reports the following case.

CASE.—“A married lady, aged thirty-four, and of good health, consulted me on account of a vesico-vaginal fistula. Fifteen years ago, she was delivered, by means of instruments, of her first child, which was dead, after having been in labor three days, during all of which time she passed no water. About ten days after her delivery an opening formed between the bladder and vagina, and since that period she has lost the retentive power of the bladder, and all the urine has escaped through the opening, except when a catheter has been introduced. Occasionally, when in a horizontal posture, there would be no escape of urine for two or three hours, though usually there was a continuous flow; but when in an erect position it was constantly dribbling, causing great inconvenience and distress. She had been eleven times pregnant since the accident, but had never gone her full period since the birth of her first child. It is not improbable that the fistula might have had some influence in the production of these repeated abortions.

“The only attempts that had been made to relieve her consisted in the introduction of a catheter, which she wore for a considerable length of time, and touching the edges of the opening with caustic. Neither of these means afforded any relief; of late nothing had been done, and she regarded her case as almost hopeless.

“Upon examination, I found the fistula situated from an inch and a quarter to an inch and a third behind the urethra, a little on the left side. It was not large, barely sufficient to admit the end of my forefinger, and surrounded by a hardened edge, nearly of the consistence of cartilage. There was some degree of morbid sensibility in the lining membrane of the vagina, so that an examination was quite painful.

“I told her that an operation for the difficulty had been several times successful; that it had more frequently failed, and that in a

few instances it had been followed by very serious consequences. At the same time, I regarded her case, on the whole, as a favorable one; and if, after this explanation, she wished for an operation, I would cheerfully undertake it. She at once consented, and it was fixed for the next day but one, May 10th, 1839; when it was performed in the following manner, in the presence of my friends Drs. Channing, C. G. Putnam and J. B. S. Jackson.

"The patient was placed on the edge of a table, in the same position as in the operation for lithotomy. The parts being well dilated, I introduced a large bougie into the urethra, and carried it back as far as the fistula. In this way I was able to bring the bladder downwards and forwards, so that the opening was brought fairly into view. The bougie being then taken by an assistant, I made a rapid incision with the scalpel around the fistula, about a line from its edges, and then removed the whole circumference of the orifice. As soon as the bleeding, which was slight, had ceased, I dissected up the membrane of the vagina from the bladder all around the opening, to the extent of about three lines. This was done partly with the view of increasing the chance of union, by presenting a larger surface, and partly to prevent the necessity of carrying the needles through the bladder. I then introduced a needle, about a third of an inch from the edge of the wound, through the membrane of the vagina and the cellular membrane beneath, and brought it out at the opposite side, at about an equal distance. Before the needle was drawn through, a second and a third were introduced in the same way; and these being found sufficient to close the orifice, they were carried through, and the threads tightly tied. Each thread was left about three inches in length. I should have remarked that I found no difficulty in introducing the needles by the hand, the fistulous opening having been brought so low down and so fairly in view.

"A short silver catheter, constructed for the purpose, was then introduced into the bladder, and the patient was conveyed to the bed and laid on her right side, to prevent any urine from coming in contact with the wound. I found her in the evening, eight hours after the operation, quite comfortable. She had had some smarting for two or three hours, but this was soon gone; she complained a little of the catheter; all the water flowed through it, and was received upon cloths. She was directed to live on thin arrowroot, milk-and-water, and a solution of gum-Arabic.

"In the morning I removed the catheter, lest it might become obstructed, and after cleansing replaced it. No water had escaped through the wound. The patient had slept some in the night; her pain had been slight, and all her sufferings she referred to the instrument. Her pulse was good, and she had no febrile symptoms. She was directed to keep in the same position, to live on the same diet, and take a solution of salts early the next morning.



"She went on perfectly well for five days, the catheter being removed daily. At this time I examined her by means of a speculum. I found that the stitches were quite firm, and that the wound had apparently healed in its whole extent. There was no oozing of water through it, though she was then lying on her back, and there was urine in the bladder, as it flowed through the catheter as soon as I introduced it. I then cut away the stitches, which I found by no means easy, as I was afraid to bring down the bladder as was done in the operation, lest the wound might be torn open. The stitches, however, were at length safely removed, and in doing this I was much indebted to the assistance of my friend Dr. Putnam.

"A smaller catheter was now introduced, and the patient put to bed in the same position as before. She continued very comfortable for two days, much more so than she had been at any time before, which she attributed to the size of the instrument. I then removed the catheter altogether, and directed her to introduce it every three hours, so as to prevent any accumulation of urine. This she did till the second night, when she slept quietly for seven hours, and on waking felt no inconvenience. Twice, also, during this period, she passed water by the efforts of the bladder alone; so that the organ had already regained in part its expulsive power, as well as that of retention. She now sat up, introduced the instrument less frequently, and was allowed a more generous diet.

"At the end of seventeen days from the operation, I examined her again; the wound was entirely healed and apparently firm, and the soreness nearly gone. I advised her to introduce the catheter two or three times a day for some weeks; and on the following day she returned home by water, a distance of nearly two hundred miles."

We have reported this case because it contains the essential points of Dr. Hayward's method; we have seen that, not only was the operation crowned with success, but further that the symptoms following it were extremely mild. The author attributes the absence of serious symptoms, first to the want of all traction exerted upon the edges of the fistula, and then to the fact that the bladder was not at all involved in the introduction of the needles.

But there are in this method principles too important to be passed by with a mere mention, particularly if we consider the time (1839) when this statement was published. The manner of operating upon vesico-vaginal fistula had been then much less studied than at present; the important works which we possess had not yet been published, or at all events were not generally known. Therefore, Dr. Hayward ought to be considered a real innovator, and a successful innovator.

Let me be permitted to examine separately the prominent points

of his operation. 1st. Approximation by *broad* freshly cut surfaces. This idea belongs to Dieffenbach. After having pared, perpendicularly, the edges of the fistula for about a line in width, he proposed and executed the detachment of the mucous membranes of the vagina and bladder, and their separation to the extent of two lines. He succeeded by this means in closing, in two operations, a wide fistula for a woman 28 years old. He says, very explicitly, that this detachment has for its object to obtain a *broad* surface for re-union. Dr. Hayward has been one of the first to fully understand all the importance of this precept, and, although the method of detachment all around the fistula (*décollement périphérique*) has been now nearly abandoned, the idea of increasing, by some means or other, the too narrow extent of the raw surfaces which perpendicular paring gives, this idea, I say, is found not only in all the American methods, but in several works of French surgeons. In our country, but not till 1841, Gerdy recommended approximation by broad surfaces; he dissected up the vaginal mucous membrane, turned back the flaps obtained from the side of the vagina, and held them back to back by the raw surfaces, by means of the quilled suture.

A year later, Dr. Leroy (of Etioilles), in a paper filled with ingenious ideas, also insists on the advantages of the same principle; only, instead of dissecting up and doubling back the lining of the vesico-vaginal septum, he proposed to unite, by the aid of instruments, prepared for the purpose, the walls of the vagina made raw around the opening.

I think it useless to dwell longer either upon the history or the advantages of this first precept. I believe it fundamental in the operation for vesico-vaginal fistula; as in our day, however, it is not rigorously enough observed, for in our authorities it passes, so to speak, unperceived in the immense crowd of proposed modifications, I have thought that I would make it particularly prominent. To the promulgation of this important principle will be attached the names of Dieffenbach, Gerdy, Hayward, and Leroy (d'Etioilles).

2dly. Passing the thread exclusively in the thickness of the vesico-vaginal wall, without injuring the mucous membrane of the bladder.

This important rule has been clearly laid down by Dr. Hayward, who attributes to the observance of it much of the absence of severe symptoms in his operations. It is incontestable, in fact, that in the ordinary methods each thread, twice perforating the mucous membrane of the bladder, creates by this means two ducts for the slow infiltration of the urine into the submucous cellular tissue of the bladder; a tissue which, as we know, is very loose. Still more; small fistulæ have frequently been observed to have been created by the threads themselves. In short, these same threads, being, in themselves, a cause of inflammation, and inflammation being the



principal cause of the failure of the sutures to bring about union, everything unites to show the value of a method which does not involve the mucous membrane of the bladder in the paring, and which removes it from the permanent and injurious contact of the uniting substances. As to this, Dr. Hayward does not conceal the source from which he derived his idea; it is a passage in Dieffenbach which has put him upon the track of this important improvement. The Berlin surgeon, in fact, finished his paper with the following passage: "The operation for vesico-vaginal fistula is always dangerous; principally, on account of the damage done to the bladder, the suture producing always more or less inflammation in the edges of the fistulous opening, or in the surrounding parts." Dieffenbach saw there a real danger, which we seek now too much to conceal; but he did not do what was necessary to avoid it. In one case, indeed, he had used a suture in which the needle passed between the two membranes without penetrating that of the bladder; but, in ordinary cases, after having effected the detachment above described, he passed the thread both through the bladder and the vagina; or, in other words, he pierced through both mucous surfaces.

Since we are historians, we ought to examine further the just fear inspired by piercing the mucous membrane of the bladder, and some of the plans offered to remedy this. In the very important paper published by Lallemand (de Montpellier), in 1825, this surgeon expressed several times his fear of fixing hooks in the bladder. In 1829, M. Laugier, having considered these various inconveniences, invented an instrument with which to perform this operation. \* \* \* \* \* [His object was to unite the sides of the vesico-vaginal fistula by drawing upon the firm tissue of the vagina, without involving the bladder.]

Without being acquainted with the operation of M. Laugier, as usually only the instrument with which it is performed is spoken of, without stating the principle upon which its employment rests, Dr. Hayward arrived at altogether analogous conclusions concerning the suture: "It seems to me," said he, "that, in almost every case in which the ligature would be the proper mode of operating, the edges of the bladder can be brought in contact without wounding that organ. The chance of adhesion would be much greater, and the danger of inflammation incomparably less. By dissecting up the membrane of the vagina to a considerable extent around the orifice, and carrying the needles through this at some distance from the edge of the wound, I cannot doubt that the edges of the bladder, which, of course, should be previously pared, may in almost every case be brought into close contact."

Inspired by Lallemand, M. Laugier laid down the principle; warned by Dieffenbach, Dr. Hayward applied it with success. This is, in my opinion, the paternity of a rule of practice of undeniable



importance, which we have not preserved in France, but which American surgery has very generally adopted.

3d. The bringing down of the vesico-vaginal wall, in order to render the fistula accessible to sight, and to instruments.

One of the circumstances which has most retarded the progress of the operation which occupies us, is the difficulty of handling instruments at the bottom of a narrow cavity, and of paring down, and sewing, an opening scarcely visible. This objection discouraged J. L. Petit; it is found under different forms, in most works upon this subject. Lallemand himself, although a skilful surgeon, recoiled before it; and it is on account of these obstacles, that caustic is constantly praised and made use of. We must confess that the difficulty is great; Dr. Hayward triumphed over it by a very simple method, and in his very first attempt in 1839. "The patient was placed upon the edge of a table, in the same position as in the operation for lithotomy. The parts being well dilated, I introduced a large bougie into the urethra, and carried it back as far as the fistula. In this way I was able to bring the bladder downward and forward, so that the opening was brought fairly into view."

If we recollect that the fistula in the case referred to was situated fifteen or sixteen lines from the meatus urinarius, it is easy to understand the mechanism of the operation. The instrument introduced by the urethra acts as a lever; by raising the exterior part toward the abdomen, the upper wall of the vagina, with the vesical portion, is depressed. The bougie ought only to be unyielding; Dr. Hayward afterward used one of whalebone.

This necessity of bringing down the fistulous opening to facilitate the paring of the edges, and the passage of the sutures, has exercised, from the first, the minds of surgeons. In 1828, M. Malagodi hooked the fistulous opening with his finger, bent and introduced into the vagina. A defective method; since the action of the cutting instrument is retarded by the finger, and the surgeon, of course, has only his right hand to pare with. Sanson thought to depress the fistula, by acting through the bladder; so he introduced the fore-finger of the left hand into the urethra, and thus pressed it directly upon the lower wall of the bladder. But the urethra is not always sufficiently dilatable to admit, without violence, the large fingers of many operators. Sanson, to remedy this, had the audacious plan of cutting open the urethra with the double lithotome, in order to facilitate the introduction of the finger. A grave operation to commence with, and which has received too much praise, and which, it seems to me, ought to be absolutely proscribed.

On the whole, bringing down the fistula by Dr. Hayward's method seems to me applicable in those cases where the abnormal orifice is not situated too far from the vulva, and where the operation is performed with the patient lying upon her back; this

method, besides, is entirely harmless; further, it is efficacious; since, as we have seen, the sutures can be placed, and the threads knotted, with the hand, which amounts to almost the same thing as operating upon a superficial surface.

If the fistula was situated deep, near the neck of the uterus, I think that it would be very difficult to bring it down enough with the bougie in the bladder, and that it would be necessary then to try other expedients. As for the rest, the means intended to expose the fistula to sight, are closely allied to the question of the best position for the patient to take; a point much controverted, and which we must discuss later.

To resume; the first work of Dr. Hayward brought to light, in 1839, two important precepts.

1st. Bringing the edges together by broad, freshly-cut surfaces.

2d. Placing the threads outside the mucous membrane of the bladder.

In April, 1851, Dr. Hayward published a second paper on vesico-vaginal fistulas, in the Boston Medical and Surgical Journal. Before passing to the analysis of this interesting paper, we will devote some moments to two other celebrated American surgeons, who have also studied the same subject. I mean Drs. Mettauer and Pancoast. Unfortunately I have been unable to consult their original works; only some extracts, very much shortened, have come to my knowledge, and I have long since learned to distrust simple quotations and even succinct analyses.

According to Dr. Bozeman, Dr. Mettauer, known for his many works on reparative surgery, has tried the operation for vesico-vaginal fistula since 1830. The method of Dr. Mettauer consists in paring the edges of the opening, then bringing them in contact by the interrupted suture made with leaden wire. These wires traverse the whole vesico-vaginal wall at the distance of an inch from the pared edges, then when enough have been placed, the ends of each are twisted together until the exact meeting of the lips of the wound is effected. They are then cut off, outside the vulva; on the third day, the wires are tightened by fresh torsion, and at length finally removed, about the tenth day. Dr. Mettauer has often since employed the same method, without much modification, and with much success.

The first publication of this surgeon was made in 1847, in the Virginia Medical and Surgical Journal, which it has been impossible for me to procure. The priority in printing, then, rests with Dr. Hayward, who, moreover, operated quite differently.

Neither have I been able to consult the account of the operations of Dr. Pancoast, published in the Medical Examiner, May, 1847; fortunately Dr. Sims gives a sufficiently long extract from it.

*Method of Dr. Pancoast, of Philadelphia.*—The special character of this operation consists in re-uniting solidly the edges of the abnormal opening, on the principle of the tenon and mortise.



Thus, four freshly-cut surfaces are brought in contact, which increases the chances of union by first intention. The edges should have considerable thickness; when they are not in this condition, they should be thickened by repeated applications of nitrate of silver, or better, by the hot iron. The parts being as much dilated as possible with Charrière's speculum, the movable valve of which has been taken out, at the same time that an assistant raises the outer part of the speculum toward the pubis, the first step of the operation is to split the posterior lip of the fistula, to the depth of half an inch. The opposite lip is then pared to the shape of a wedge; first, by turning it out, as far as possible, with a blunt hook, to pare the mucous membrane of the bladder with the curved scissors and scalpel, then by shaving off in its turn the mucous membrane of the vagina, upon the whole lip, to the extent of three quarters of an inch. Now comes a very difficult, but a very important part of this operation. The hæmorrhage being arrested, the bleeding, wedge-shaped tongue, into which the anterior lip has been converted, is to be inserted into the groove, or mortise, made in the posterior lip, and the two parts to be held in contact. This is done by means of a particular kind of suture, useful in many plastic operations, and described by the inventor in the *American Journal*, for October, 1842. When the sutures are knotted, the tongue is enclosed in the mortise; the threads are left a fortnight, or more, until they become loose, an elastic catheter being left in the bladder to prevent distention. A bladder filled with cold water is applied to the vulva for thirty-six hours, in order to moderate the inflammation. On the second or third day, frequent vaginal injections of sulphate of zinc are made use of, to increase the vigor of the parts. On the fourth or fifth day, a brush dipped in a solution of nitrate of silver is passed over the line of re-union, the strength of the solution being gradually increased. Immediate union may be expected in a great part of the fistula; where it fails, secondary union is promoted by the solid nitrate of silver, which develops a layer of granulations upon the surfaces, which the plastic suture still holds in contact."

Dr. Pancoast has cured by his method two patients. In one, there was complete destruction of a segment of the urethra; the other had an opening at the lower part of the bladder, more than sufficient to admit the end of a finger.

We again find the principle of approximation by broad surfaces carried to its extreme limits by the method of Dr. Pancoast, a true suture by schindylesis. The efficiency of this operation is evident; unfortunately, it presents extreme difficulties of execution, and it cannot, therefore, be applied to all cases. I have known an operation very analogous to this, practised a short time since, by my excellent colleague M. Lenoir. The posterior border of this fistula was formed by the *os tinea*. Two operations by the ordinary sutures had failed. M. Lenoir devised the plan of

splitting transversely the anterior lip of the neck of the uterus, in such a manner as to form a deep groove, in which he enclosed the anterior lip of the fistula. A cure was effected. This is a case which deserves the honor of the publication of a detailed account.

I observe also, in the treatment after the operation established by Dr. Pancoast, the use of astringent injections, of cauterizations of the new cicatrix with nitrate of silver, and, lastly, the very long time the sutures are kept in.

This method will, I doubt not, be again found useful in certain cases.

#### SECOND ARTICLE.

The second publication of Dr. Hayward contained fewer original ideas than the first; but, in requital for this, we find information of great utility, and such as surgeons are usually too sparing of. I will now give his statement of several unsuccessful cases, which induced the author to endeavor to seek out the causes of failure, and to modify his first operation in those points in which it appeared to him to be defective.

We cannot too much insist upon the necessity of publishing, with full details, an account of the hindrances experienced in performing operations; it is the only way to pass judgment upon what has been done, and warn others against new mistakes, and to prevent the patient from being continually the subject for new experiments. A surgeon has not done enough when he has indicated, in a line or two, that one of his operations has failed; for those who come after him could always attribute the want of success to accident, and are induced to try again in the hope of being more fortunate. Brevity in such a case, although it may bear witness to the good faith of an author, does not guarantee him from the suspicion of ignorance, and increases the amount of responsibility which rests upon him. Here, as elsewhere, the naked truth is necessary without those reservations which serve it as a veil.

Dr. Hayward performed his second operation in August, 1840, upon a woman of about 35 years of age, already the mother of several children. The case was very unfavorable. In the space of two years, six operations were performed, which produced an amelioration of the difficulty; but the text is not sufficiently explicit for us to know whether the fistula was ever completely closed. These are the last statements with regard to it: "The general condition was gradually improved, the ulcerations (from the upper part of the thighs to the knees) caused by the urine had disappeared. The urine could be retained for several hours. The bladder had, in part, recovered its contractile and expulsive powers. The patient could, without inconvenience, walk and ride. Her condition was entirely changed, life was no longer a burden to her; she became once more a happy and useful member of society."

These words allow us to place this among the successful cases,



although the statement is not altogether complete. For the rest, if a general table of the operations for vesico-vaginal fistula should at any time be formed, it would be necessary to resolve the cases into three categories: those which were entirely unsuccessful, those which were completely successful, and those which were relieved in different degrees. The last division, indeed, is sufficiently elastic to be abused a little; it must, however, be agreed that the surgeon has not labored in vain when the patient is able to retain her water two or three hours, or where a little plugging of the vagina is sufficient to remedy a slight dribbling. A result like this, although imperfect, is yet very advantageous, and experience shows that reparative surgery has often obtained similar ones. I address this digression to those too difficult critics who are inclined to reject plastic operations, under the pretext that they do not completely re-establish the form and functions of an organ.

I come now to the unsuccessful cases. In December, 1840, Dr. Hayward treated a patient of about 22 years of age. The operation and its results went on altogether successfully; at the end of a proper time the parts were examined. The adhesion appeared complete; the sutures were therefore removed. But, on the following day, the water passed freely through the fistula, which appeared to be as large as before the operation. The patient refused to submit to a new trial.

In seeking for the cause of this vexatious accident, Dr. Hayward thought that the removal of the sutures might have had its part. It was impossible to reach the threads without bringing down the bladder to a certain point, and in consequence without exercising upon the newly re-united parts a traction capable of breaking the new cicatrix, as yet destitute of sufficient power of resistance.

This hypothesis appeared to be soon confirmed. A new patient presented herself in October, 1842. The injury offered the greatest resemblance to that of the preceding case; everything promised a favorable result. The operation was performed, and, some days after, an examination was made of the parts. A solid adhesion appeared to be established throughout the whole extent of the fistula. Nevertheless, in bringing down the bladder a little, in order to cut the stitches, the adhesive matter which united the edges of the opening yielded suddenly, and the opening showed itself as large as before the operation. Whether the parts would have remained re-united if all traction had been abstained from, it is impossible to say; in all these cases from the first, experience confirmed Dr. Hayward in the idea that the proceedings necessary to bring down the sutures could very much affect the re-union; he therefore thought it best to change the manner of operating.

Up to this time the mode of operating, and the proceedings after it, such as we have described in the first article, had not varied, so that the first phase of the operation of Dr. Hayward ex-

tended in reality to the year 1843. Let us cast a glance to the general results which it had furnished. Four patients had been treated. With the first there had been complete success; with the third and fourth, failure at the first attempt. The second had to be operated on six times before she was cured, even allowing that a radical cure was effected in her case. This gives us the following proportion: 9 operations—7 more or less unsuccessful, 2 successful.

To resume: two patients had been cured out of four. Nothing proves that the other two would not have been equally fortunate, with a little more perseverance. If the time when these attempts were made is taken into consideration, the proportion is not discouraging.

Let us see, in the mean time, to what new expedient Dr. Hayward thought he ought to have recourse. He gave up the removal of the sutures, and resolved to leave them in until they were loosened by the ulceration which they would cause. From that time he changed, also, the threads he had used, and substituted for them ligatures of dentists' silk, which are made of a single twist. The paring and the mode of passing the sutures remained the same. The object of this change is clearly shown in the following sentence: "I regard the small size of the ligature, and allowing it to remain in its place until separated by the efforts of nature, as a great improvement, and well calculated to have a favorable influence on the result of the operation."

An analysis of the following cases will enable us to judge of the value of the innovation.

CASE I.—A woman of 23 years of age was delivered of her first child five years and a half before, the labor lasting four days. Two weeks after, a slough separated from the upper wall of the vagina, leaving a transverse opening into the bladder two inches long, situated an inch behind the meatus urinarius. Now, in consequence of having worn a catheter for a long time, the opening is reduced to the size of the end of a man's finger. Cannot retain the urine, except when perfectly quiet, and then only for a very short time. Various nervous troubles; great irritability of the vagina.

The operation was performed October 16th, 1843. The fistula was half an inch in length, and was situated an inch and a half behind the meatus urinarius; two sutures were used to bring the edges together. A large female catheter was then introduced and secured *in situ*, and the patient carried to bed, and directed to lie upon the right side.

Had some general uneasiness during the following days, but no serious symptom. On the 24th, her condition was very good, did not wear the catheter, could retain her water an hour or two. In the upright position the water passed by the meatus, and none by the fistula. On the 26th, had not worn the catheter for two days,



was able to retain urine, but not to expel it voluntarily. On the 29th, the stitches still remained in the wound; some symptoms of general uneasiness: catamenia appeared Nov. 4th; symptoms improved during the following days. Nov. 17th, the fistula was entirely closed; troubled at times with irritability of the bladder. The patient had not yet regained control over the meatus, but was not obliged to use catheter at all. Rode out every pleasant day; her condition was comfortable. Left the Hospital Nov. 27th.

[On the 19th of February\* of the following year (1844), three months after the cure was effected, returned to the Hospital. Reported that, on leaving the Hospital, she rode to Springfield, travelling all day. Passed urine once without difficulty, and on endeavoring to again, found herself unable to do so. Was in great pain all night, and since that time had had constant passage of urine into the vagina. On examination, a small opening was found at the upper part of the cicatrix, large enough to admit the end of the catheter, through which the urine trickled down over the cicatrix, which is covered with fungous granulations. Several ounces of urine in the bladder.] The patient placed herself again under the care of Dr. Hayward, who, between April 25th and August 15th, operated four times, gaining something at each operation, so that the fistula was reduced to one of so small a diameter that the bladder regained not only its power of retaining, but also of expelling its contents at the patient's will.

The patient returned home, and the operator was informed, in 1855, that her health was good, that she suffered but little from her infirmity, and that she had given birth to a living and healthy child.

Of all the patients which Dr. Hayward treated, this one was the most difficult to manage, both during the operations and in the intervals between them, and this may, to a certain extent, account for the incomplete success obtained.

CASE II.—Woman of 29 years of age; confined with her first child three months before; labor was long, terminated by the forceps; child dead. She had not passed water for thirty-six hours, when she was delivered; an hour after, the urine began to dribble into the vagina, and continued to flow off by that passage afterward.

On examination, Dr. Hayward found a small transverse fissure, about two inches within the vagina. The operation was performed July 5th, 1845. The bladder was brought down by means of a whalebone bougie, introduced through the urethra, which caused much pain. Two sutures were used to close the opening, a catheter introduced, and the patient placed upon her side. The urine pass-

\* M. Verneuil has fallen here into the error of supposing that the time when the fistula re-opened was February 19th, 1844; whereas it was November 28th, 1843, the day after her discharge from the Hospital. This mistake has been corrected in the translation, together with several others of less consequence, but it was thought best to mention them, to account for the variation from the original.—TRANS.

ed readily through the catheter until the fourth day, when it became obstructed and was removed, and another substituted.

The ligatures came away on the seventh day; catheter was removed two or three days after. The patient could retain her urine for nearly two hours. After this time it passed through the opening, which is much smaller than before the operation. Discharged relieved.

CASE III.—A woman 30 years of age. Treated for a supposed incontinence of urine since her last confinement. An examination showed the existence of a fissure, which allowed most of the urine to pass through it; when in the erect position, the urine could be retained only a very short time. She suffered much pain, and there was excoriation and great sensibility of the neighboring parts. The sutures were inserted, and the treatment conducted as in the previous cases. At the end of a fortnight, it appeared that the fistula was diminished, but not entirely closed. A second operation was then performed about three weeks after. The result was that the bladder recovered, in a great measure, its powers of retention and expulsion. A little more than a year afterward, Dr. Hayward saw the patient again; her condition was very much improved since the last operation. By a little care on her part to introduce the catheter occasionally, nearly all the water passed through the natural passage. She thought that there was no necessity to submit to further surgical treatment, nor did he think that any was called for. Nothing has been heard from her since, but it is probable that the fistulous opening has contracted still more, so that she experiences little if any inconvenience from it.

CASE IV.—A woman 40 years of age; the injury was produced at her third labor, which, at the end of twenty-two hours, was terminated by a midwife, without instruments. The fistula, three quarters of an inch in extent, with thickened and indurated edges, was situated at the fundus of the bladder, near the os tincæ.

The operation was performed March 14th, 1847, with sulphuric ether, the wall of the vagina being brought down by means of the whalebone bougie. The edges were then pared, so that the cut surfaces inclined from without inward, and when in contact the mucous membrane was corrugated. Two sutures were then taken, not extending through the inner coat of the bladder. By this the fissure was completely closed. A large-sized catheter was then introduced into the bladder and secured there. Owing to the ether, the parts were so much relaxed that the bladder was brought down with the greatest ease. On the 21st of March, the fissure was very much diminished, but it still allowed a small quantity of urine to pass through; the catheter was removed and replaced by an elastic bougie. April 11th, the urine leaked a little through the fistula, but was retained for several hours; the sutures came away on the morning of this day. In the evening the whole trouble returned, the water continually running through the fissure.



April 14th, the operation was repeated. Patient was placed in bed with the trunk elevated, so that the urine may gravitate below the fissure. April 17th, patient doing well; catheter removed, and an elastic one introduced every three or four hours. April 25th, fistula is closed; no leakage; incontinence of urine; catheter to be introduced many times a day for a long time. May 3d, discharged well.

This case is interesting from various causes: anæsthesia assisted the bringing down of the vesico-vaginal wall; the paring was so done that the cut surfaces inclined from without inward, so that the mucous membrane of the bladder was corrugated when the edges of the fistula were in contact; the position of lying upon the side, after the operation, was changed for one almost sitting. The second operation was performed only three days after the rupture of the first union. It is annoying that nothing is said as to how the operation was performed, and whether the paring was done in the same manner. In general, quite a long time intervenes between two consecutive operations, which is, perhaps, an error. Finally, wearing the catheter was omitted at the end of three days, and was replaced by frequent catheterism. We observe, in passing, that the paring and the treatment after it, in this case which was successful, were very much changed.

CASE V.—Woman 22 years of age; confined with first child eight weeks before. Flowing of water into vagina commenced two days after confinement; fistula of an oval shape, situated two and three quarters inches from meatus, is large enough to admit the end of the little finger; operation performed Dec. 16th, 1849. Etherization, bringing down the fundus of the bladder, paring and closing fistula with two sutures, were as in the preceding case. The first suture came away Dec. 26th; the second remained until Jan. 9th. There was no leakage into the vagina, the water could be retained an hour and a half and expelled at pleasure.

This patient was discharged at this time, at her own request, but it has been ascertained since that she has remained perfectly well. The second stitch came away without trouble.

We have thought that we ought to analyze all the cases which constitute the second series of operations performed by Dr. Hayward, since it is impossible to judge of the methods without making a thorough examination of the cases in which they were employed. We formed a sort of table of the results furnished by the first method. Let us submit the second to the same criterion.

Five patients were treated; three were completely cured; in the fourth case I admit the want of success, but the diminution of the size of the opening did, without doubt, relieve somewhat the inconveniences caused by the infirmity; in the last case, on the other hand, the relief amounted almost to a cure. The operations performed were thus divided: four complete cures; six unsuccessful cases; one case of almost entire success.

Taken on the whole, this result is very much superior to that of the first series. Let us now examine and see whether this increase of success is owing to chance or to improvements in the operation.

Dr. Hayward, in 1842, attributed two consecutive failures to bringing down the bladder, and the traction exerted upon the new cicatrix during the removal of the stitches; he gave up removing them from that time, and resolved to leave the expulsion of the sutures to the natural process which would relieve the tissues of these foreign bodies. We do not deny the injurious influence which any violence would have upon the fragile adhesive matter which re-unites a wound; but we think that about the eighth day the re-union possesses already a considerable power of resistance, when the uniting substance has not undergone any alteration. We think, also, that in the other case the union is very precarious, and susceptible of destruction, in spite of the prolonged retention of the means of union and of the artificial bringing together of the sides of the wound; in one word, we believe that, in the two cases to which we have alluded, the failure of the suture was decided when the threads were withdrawn. If in these cases the expulsion of the threads had been left to the efforts of nature alone, the re-appearing of the fistula would have been delayed some days, but it would have shown itself inevitably. In the fourth case, the sutures detached themselves spontaneously at the twenty-seventh day; but, seven days after the operation, the urine already flowed through the fistula, and therefore the union was not effected. In truth, the rent does not show itself until some hours after the removal of the ligatures; so that it can be easily understood how the sutures remaining in their places, could keep also the sides of the fistula in contact, at a time when the union itself had failed. This shows that we must not take the parts to be really united together, which in fact are only in close apposition.

The extent of this article will not allow us to decide at what time, after the operation for vesico-vaginal fistula, it is proper to remove the sutures. This time is, moreover, variable, according to the size and character of the thread, the extent of the fistula, and the degree of tension to which its edges are subjected in order to bring them together, so that it is difficult to give any general rule upon the subject. Nevertheless, it may be said that, from the moment when the sutures cause inflammation, their presence does more harm than good to the re-union; I do not even except the slow process designated as eliminating inflammation (set up in order to remove the sutures), since its neighborhood is always dangerous to the plastic tissue which holds the sides of the fistula together, and which is, as yet, but feebly organized.

For this reason I reject the first modification practised by Dr. Hayward, because the removal of the sutures can, in my opinion, be effected without bringing down the bladder, and without draw-



ing upon the vesico-vaginal wall. I have removed five sutures from a very deeply-situated vesico-vaginal fistula without meeting with the unfortunate result which Dr. Hayward experienced, and the thing would be very much facilitated by placing the patient upon her knees and elbows, and by the employment of the univalve speculum of Dr. Marion Sims.

One circumstance in Dr. Hayward's operation, it is true, diminishes very much the ill effects which I attribute to the spontaneous expulsion of the sutures. This is, their situation in the thickness of the vesico-vaginal wall, without penetrating into the bladder; for thus it can easily be seen how a re-union of the wound in the bladder can take place above the suture. In the usual mode of operating, on the contrary, where the suture penetrates into the bladder, to leave the sutures in until they were removed by natural processes would almost necessarily produce secondary fistulas more or less troublesome, even admitting that re-union of the original fistula had been successfully accomplished. This accident, which at least retards the cure, if it does not require new operations, may frequently be observed when a suture gives way instead of being taken out by the surgeon. The innovation introduced by Dr. Hayward comprehends two totally distinct things; and, if, after what precedes, I reject the first, it is quite otherwise with the second; that is, the small size of the sutures made use of. This is a real improvement, and is, as I shall show by and by, one of the principal points in the process of Sims and Bozeman. Diefenbach, whose authority in such a matter no one will question, extolled insect pins very much, as we know, as a means of bringing the parts into very close apposition in plastic surgery. Amussat, a person of great experience, employed the same method; and Dr. Hayward himself has employed for the hare-lip operation very slender pins, or fine steel needles. In short, the size of the foreign body placed in our tissues is by no means a matter of indifference.

Upon this small, but important point, surgeons have held diametrically opposite opinions. Some employ large sutures formed of three or four waxed threads united into a flat cord; while others use extremely fine sutures. Of course the first are placed at a sufficiently long distance from one another, while the others can, and ought to, be placed very near together. The advocates of the large sutures maintain that they bring the parts more closely together, and keep them more firmly in contact. In my opinion, however, they think of the present rather than the future; it is not to be denied that their method is the most expeditious, for two large sutures will suffice where four small ones would be necessary, and each suture requires a considerable time to be introduced; but neither can it be denied, other things being equal, that a large foreign body will produce a more rapid and more violent inflammation in our tissues than a small one of the same substance. The same persons, consistently, say that small pins, and fine threads.

act as cutting instruments, and divide the tissues more rapidly than large ones. This is an evident mistake; separation of the lips of a united wound is only caused by ulcerative inflammation; and two threads being given, that one will break the union most quickly which will produce the greatest amount of inflammation. If it is admitted that our tissues do not bear a large seton as well as a small one, the question is decided. I do not hesitate, then, to consider the ribands employed in this operation as altogether irrational, and entirely unsuited to the end proposed.

The slender threads are only liable to slight objections, which can be very easily refuted. It may be feared that they would be too weak to restrain the tendency which the lips of the wound have to separate, and that they would not bring the edges well together on account of the small hold which they have upon the tissues which they go through; that they would break during the performance of the operation, or that they would allow the re-united parts to gape in the interstices between the stitches. In order to remedy these slight inconveniences, it is necessary to select sutures which have a sufficient strength in a small bulk, and to bring them sufficiently near together, placing them four or five millimetres apart, which it would be dangerous to do with the large threads.

To resume: Dr. Hayward had a judicious appreciation of the favorable influence of small sutures, and, if he had thought of employing metallic sutures, he would have left but little for his successors to do.

Let us observe that the two papers which we have analyzed appeared in 1851, and that in them may be found the greater part of the fundamental ideas, which, in our opinion, established the superiority of the operation of Drs. Sims and Bozeman. We do not wish in any manner to depreciate the remarkable operations of these last; we have only wished to do justice to Dr. Hayward for having, during ten years (1839-1849), turned his attention to the cure of vesico-vaginal fistula, one of the greatest triumphs of modern surgery.

A desire to make this article complete, causes us to add to the previous cases an analysis of an operation performed by Mr. I. Baker Brown, a distinguished surgeon of London, by a method which, in spite of some marked differences, resembles that of Dr. Hayward, where the sutures were left to be thrown off spontaneously by the efforts of nature (*Medical Times and Gazette*, April 17th, 1858, p. 393). Mr. Brown adds some remarks to the case. He lays great stress upon union at the first attempt, a very rare result; upon allowing the stitches to come away spontaneously, as in Dr. Hayward's method; and, finally, upon an early operation, which appeared to him to be very advantageous.

We could, for our part, dilate upon the method of paring, already rendered famous by Dr. Minturn (of New York); upon the good effect of the quilled suture, &c. &c., but we should be drawn too far, and we stop ourselves here. AR. VERNEUIL.